



## General

### Guideline Title

Clinical practice guideline: non-invasive blood pressure measurement with automated devices.

### Bibliographic Source(s)

ENA Emergency Nursing Resources Development Committee. Clinical practice guideline: non-invasive blood pressure measurement with automated devices. Des Plaines (IL): Emergency Nurses Association; 2012 Dec. 13 p. [53 references]

### Guideline Status

This is the current release of the guideline.

## Recommendations

### Major Recommendations

The grades of recommendations (A–C, Not Recommended), levels of evidence (I–VII), and quality of evidence (I–IV) are defined at the end of the "Major Recommendations" field.

#### Description of Decision Options/Interventions and the Level of Recommendation

*Please note that the references listed after each recommendation represent the evidence considered when making the recommendation. This does not mean that the evidence in each individual reference supports the recommendation.*

1. Non-invasive oscillometric blood pressure measurement is appropriate for adult populations. Level A – High (Amadasun & Isa, 2005; Braam, de Maat, & Thien, 2002; Bur et al., 2003; Cameron et al., 2004; Jones et al., 1996; Landgraf, Wishner, & Kloner, 2010; Manolio et al., 1988; Roubanthisuk et al., 2007; Shahriari et al., 2003; Skirton et al., 2011; Tao et al., 2011; Vera-Cala et al., 2011)
2. Non-invasive oscillometric blood pressure measurement is appropriate for patients with trauma and shock. Level A – High (Dind et al., 2011; Skirton et al., 2011)
3. Non-invasive oscillometric blood pressure measurement is appropriate for children, including neonates. Level B – Moderate (Chiolerio, Paradis, & Lambert, 2010; Holt, Withington, & Mitchell, 2011; Menard, Park, & Yuan, 1999; Midgley et al., 2009; O'Shea & Dempsey, 2009; Park, Menard, & Yuan, 2001; Wattigney et al., 1996; Weaver, Park, & Lee, 1990; Wong, Tz Sung, & Leung, 2006)
4. Non-invasive oscillometric blood pressure measurement is appropriate for patients with comorbid conditions or other health conditions:
  - Patients who are pregnant. Level B – Moderate (Green & Froman, 1996; Lauszus et al., 2007; Pomini et al., 2001)
  - Patients with hypertension. Level B – Moderate (Gupta et al., 2009)
  - Patients with atrial fibrillation. Level C – Weak (Lamb et al., 2010)
5. Alternative cuff sites for non-invasive oscillometric blood pressure measurement is appropriate for blood pressure monitoring of adults:

- Forearm cuff site. Level B – Moderate (Schell, Morse, & Waterhouse, 2010; Schell et al., 2006)
  - Wrist cuff site. Level B – Moderate (Brennan et al., 2001; Latman & Latman, 1997; Mourad, Gillies, & Carney, 2005; Nelson et al., 2008; Rutschmann et al., 2005; Shahriari et al., 2003)
  - Thumb/Finger site. Level B – Moderate (Jagoniği, Raamat, & Talts, 2001; Nowak et al., 2011; Green, 1996)
6. Alternative cuff sites for non-invasive oscillometric blood pressure measurement is appropriate for blood pressure monitoring of pediatric patients:
- Calf cuff site. Level C – Weak (Schell et al., 2011)
7. Non-invasive oscillometric blood pressure measurements with blood pressure cuff on upper arm over sleeved arm or on bare arm below a rolled sleeve is appropriate for adult patients. Level B – Moderate (Holleman et al., 1993; Kahan et al., 2003; Liebl et al., 2004; Ma, Sabin, & Dawes, 2008; Pinar, Ataalkin, & Watson, 2010)

#### Definitions:

#### Levels of Recommendation for Practice

##### Level A Recommendations: High

- Reflects a high degree of clinical certainty
- Based on availability of high quality Level I, II and/or III evidence available using Melnyk & Fineout-Overholt grading system\* (see the "Rating Scheme for the Strength of the Evidence" field)
- Based on consistent and good quality evidence; has relevance and applicability to emergency nursing practice
- Is beneficial

##### Level B Recommendations: Moderate

- Reflects moderate clinical certainty
- Based on availability of Level III and/or Level IV and V evidence using Melnyk & Fineout-Overholt grading system\* (see the "Rating Scheme for the Strength of the Evidence" field)
- There are some minor flaws or inconsistencies in quality of evidence; has relevance and applicability to emergency nursing practice
- Is likely to be beneficial

##### Level C Recommendations: Weak

- Level V, VI and/or VII evidence available using Melnyk & Fineout-Overholt grading system\* (see the "Rating Scheme for the Strength of the Evidence" field)
- Based on consensus, usual practice, evidence, case series for studies of treatment or screening, anecdotal evidence, and/or opinion
- There is limited or low quality patient-oriented evidence; has relevance and applicability to emergency nursing practice
- Has limited or unknown effectiveness

##### Not Recommended for Practice

- No objective evidence or only anecdotal evidence available; or the supportive evidence is from poorly controlled or uncontrolled studies
- Other indications for not recommending evidence for practice may include:
  - Conflicting evidence
  - Harmfulness has been demonstrated
  - Cost or burden necessary for intervention exceeds anticipated benefit
  - Does not have relevance or applicability to emergency nursing practice
- There are certain circumstances in which the recommendations stemming from a body of evidence should not be rated as highly as the individual studies on which they are based. For example:
  - Heterogeneity of results
  - Uncertainty about effect magnitude and consequences
  - Strength of prior beliefs
  - Publication bias

## Grading the Levels of Evidence\*

- I. Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs) or evidence-based clinical practice guidelines based on systematic reviews of RCTs
- II. Evidence obtained from at least one properly designed RCT
- III. Evidence obtained from well-designed controlled trials without randomization
- IV. Evidence obtained from well-designed case control and cohort studies
- V. Evidence from systematic reviews of descriptive and qualitative studies
- VI. Evidence from a single descriptive or qualitative study
- VII. Evidence from opinion of authorities and/or reports of expert committees

## Grading the Quality of the Evidence

- I. Acceptable Quality: No concerns
- II. Limitations in Quality: Minor flaws or inconsistencies in the evidence
- III. Major Limitations in Quality: Many flaws and inconsistencies in the evidence
- IV. Not Acceptable: Major flaws in the evidence

\*Melnik, B. M., & Fineout-Overholt, E. (2005). Evidence-based practice in nursing and healthcare: A guide to best practice. Philadelphia, PA: Lippincott, Williams, & Wilkins.

## Clinical Algorithm(s)

None provided

## Scope

## Disease/Condition(s)

Conditions that require non-invasive blood pressure measurement with automated devices, including:

- Hypertension
- Atrial fibrillation
- Trauma and hypotension
- Pregnancy

## Guideline Category

Diagnosis

Management

Technology Assessment

## Clinical Specialty

Cardiology

Emergency Medicine

Internal Medicine

Nursing

Obstetrics and Gynecology

Pediatrics

## Intended Users

Advanced Practice Nurses

Allied Health Personnel

Emergency Medical Technicians/Paramedics

Hospitals

Nurses

Physician Assistants

Physicians

## Guideline Objective(s)

To focus on evidence-based practices regarding use of non-invasive, oscillometric blood pressure measurement for patients across the lifespan in the emergency care setting

## Target Population

Emergency department patients of all ages, including pregnant women and patients with hypertension, atrial fibrillation, trauma and hypotension

## Interventions and Practices Considered

1. Use of non-invasive oscillometric blood pressure devices
2. Location of cuff when measuring blood pressure with oscillometric device (upper arm, forearm, wrist, finger/thumb, calf)
3. Effect of clothing with oscillometric blood pressure devices

## Major Outcomes Considered

Accuracy and precision of non-invasive oscillometric devices and measurement techniques compared with auscultatory blood pressure measurements

## Methodology

### Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

### Description of Methods Used to Collect/Select the Evidence

All articles relevant to the topic were identified via a comprehensive literature search. The following databases were searched: PubMed, Google

Scholar, MEDLINE, Cumulative Index to Nursing and Allied Health (CINAHL), Cochrane Library, Agency for Healthcare Research and Quality (AHRQ; [www.ahrq.gov](http://www.ahrq.gov)), and the National Guideline Clearinghouse ([www.guideline.gov](http://www.guideline.gov)).

Searches were conducted using a variety of different search combinations of key words including blood pressure, blood pressure measurements, automated blood pressure, oscillometric blood pressure, auscultatory blood pressure, alternative cuff sites for blood pressure measurements, monitoring blood pressure, intermittent blood pressure, non-invasive blood pressure measurement, blood pressure monitoring, and effect of clothing on blood pressure measurement. Initial searches were limited to English language articles from January 1990 to November 2012. In addition, the reference lists in the selected articles were scanned for additional pertinent references. Research articles from emergency department (ED) settings, non-ED settings, other emergency care settings, position statements and guidelines from other sources were also reviewed.

Articles that met the following criteria were chosen to formulate the clinical practice guideline (CPG): research studies, meta-analyses, systematic reviews, and existing guidelines relevant to the topic of non-invasive blood pressure (BP) monitoring using automated devices. Other relevant articles relevant to the topic (e.g., BP monitoring standards) were reviewed and included as additional information. Articles that did not include a comparison of oscillometric BP measurements to auscultatory or arterial pressure measurements were not included in the evidence summary. Auscultatory and arterial pressure measurements are representative of the most accurate non-invasive and invasive BP measurements respectively; therefore, without this comparison accuracy of oscillometric devices could not be determined for purposes of this systematic review of evidence. All BP measurement devices described in this review are currently commercially available.

Articles that were included meta-analyses or systematic reviews were not considered independently unless there were factors not addressed in the meta-analysis/systematic review.

## Number of Source Documents

44 documents were included in the evidence tables.

## Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

## Rating Scheme for the Strength of the Evidence

Grading the Levels of Evidence\*

- I. Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs) or evidence-based clinical practice guidelines based on systematic reviews of RCTs
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Grading the Quality of the Evidence

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## Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

## Description of the Methods Used to Analyze the Evidence

The clinical practice guideline (CPG) authors used a standardized reference table to collect information and assist with preparation of tables of evidence ranking each article in terms of the level of evidence, quality of evidence, and relevance and applicability to practice. Clinical findings and levels of recommendations regarding patient management were then made by the Emergency Nurses Association (ENA) 2012 Emergency Nursing Resources Development Committee according to the ENA's classification of levels of recommendation for practice, which include: Level A High, Level B Moderate, Level C Weak or Not recommended for practice (see the "Rating Scheme for the Strength of the Recommendations" field).

## Methods Used to Formulate the Recommendations

Expert Consensus

## Description of Methods Used to Formulate the Recommendations

This clinical practice guideline (CPG) was created based on a thorough review and critical analysis of the literature following Emergency Nurses Association (ENA)'s Guidelines for the Development of Clinical Practice Guidelines (see the "Availability of Companion Documents" field).

Conference calls with Subcommittee members and staff are held as necessary to discuss progress and facilitate the Subcommittee's work. All members of the Subcommittee independently complete an exhaustive review of all identified literature, complete a separate evidence table for each topic (if possible), and then reconvene to reach consensus. Each Subcommittee prepares a description of the topic, definition, background, significance, and evidence table. All articles and documents are uploaded to the CPG Development website for easy retrieval by everyone involved with the development process. The Subcommittee identifies and assigns preliminary scores for quality and strength of evidence, and describes conclusions based on the review of the body of evidence. Each Subcommittee also serves as "second readers" for another topic; this assures an in-depth look at the literature by two Subcommittees. The entire Committee reads the articles and reviews the evidence-appraisal tables for each topic and then finalizes implications for practice and the level of recommendation.

## Rating Scheme for the Strength of the Recommendations

Levels of Recommendation for Practice

### Level A Recommendations: High

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- There are some minor flaws or inconsistencies in quality of evidence; has relevance and applicability to emergency nursing practice
- Is likely to be beneficial

### Level C Recommendations: Weak

- Level V, VI and/or VII evidence available using Melnyk & Fineout-Overholt grading system\* (see the "Rating Scheme for the Strength of the Evidence" field)

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- There are certain circumstances in which the recommendations stemming from a body of evidence should not be rated as highly as the individual studies on which they are based. For example:
  - Heterogeneity of results
  - Uncertainty about effect magnitude and consequences
  - Strength of prior beliefs
  - Publication bias

\*Melnik, B. M., & Fineout-Overholt, E. (2005). Evidence-based practice in nursing and healthcare: A guide to best practice. Philadelphia, PA: Lippincott, Williams, & Wilkins.

## Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

## Method of Guideline Validation

Internal Peer Review

## Description of Method of Guideline Validation

The Institute for Emergency Nursing Research (IENR) Advisory Council reviews the final document for overall validity and provides feedback as appropriate using the Clinical Practice Guidelines (CPGs) Evaluation Worksheet. Reviews and feedback are sent to the Subcommittee to evaluate and incorporate, as appropriate. Emergency Nurses Association (ENA) staff creates the final products for publication with input from the Committee.

## Evidence Supporting the Recommendations

## References Supporting the Recommendations

Amadasun FE, Isa JJ. A comparison of sphygmomanometric and oscillometric methods of blood pressure measurements in adult in-patients. Niger J Clin Pract. 2005 Dec;8(2):86-9. [PubMed](#)

Braam RL, de Maat C, Thien T. Accuracy of the Welch Allyn Vital Signs Monitor 52000 automatic blood pressure measuring device according to a modified British Hypertension Society protocol. Blood Press Monit. 2002 Jun;7(3):185-9. [PubMed](#)

Brennan PF, Moore SM, Bjornsdottir G, Jones J, Visovsky C, Rogers M. HeartCare: an Internet-based information and support system for patient home recovery after coronary artery bypass graft (CABG) surgery. *J Adv Nurs*. 2001 Sep;35(5):699-708. [PubMed](#)

Bur A, Herkner H, Vleck M, Woisetschlager C, Derhaschnig U, Delle Karth G, Laggner AN, Hirschl MM. Factors influencing the accuracy of oscillometric blood pressure measurement in critically ill patients. *Crit Care Med*. 2003 Mar;31(3):793-9. [PubMed](#)

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Chiolero A, Paradis G, Lambert M. Accuracy of oscillometric devices in children and adults. *Blood Press*. 2010 Aug;19(4):254-9. [PubMed](#)

Dind A, Short A, Ekholm J, Holdgate A. The inaccuracy of automatic devices taking postural measurements in the emergency department. *Int J Nurs Pract*. 2011 Oct;17(5):525-33. [PubMed](#)

Green DW. Use of a neonatal noninvasive blood pressure module on adult patients. *Anaesthesia*. 1996 Dec;51(12):1129-32. [PubMed](#)

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Holleman DR Jr, Westman EC, McCrory DC, Simel DL. The effect of sleeved arms on oscillometric blood pressure measurement. *J Gen Intern Med*. 1993 Jun;8(6):325-6. [PubMed](#)

Holt TR, Withington DE, Mitchell E. Which pressure to believe? A comparison of direct arterial with indirect blood pressure measurement techniques in the pediatric intensive care unit. *Pediatr Crit Care Med*. 2011 Nov;12(6):e391-4. [PubMed](#)

Jagomagi K, Raamat R, Talts J. Effect of altering vasoactivity on the measurement of finger blood pressure. *Blood Press Monit*. 2001 Feb;6(1):33-40. [PubMed](#)

Jones D, Engelke MK, Brown ST, Swanson M. A comparison of two noninvasive methods of blood pressure measurement in the triage area. *J Emerg Nurs*. 1996 Apr;22(2):111-5. [PubMed](#)

Kahan E, Yaphé J, KnaaniLevinz H, Weingarten MA. Comparison of blood pressure measurements on the bare arm, below a rolled-up sleeve, or over a sleeve. *Fam Pract*. 2003 Dec;20(6):730-2. [PubMed](#)

Lamb TS, Thakrar A, Ghosh M, Wilson MP, Wilson TW. Comparison of two oscillometric blood pressure monitors in subjects with atrial fibrillation. *Clin Invest Med*. 2010;33(1):E54-62. [PubMed](#)

Landgraf J, Wishner SH, Kloner RA. Comparison of automated oscillometric versus auscultatory blood pressure measurement. *Am J Cardiol*. 2010 Aug 1;106(3):386-8. [PubMed](#)

Latman NS, Latman A. Evaluation of instruments for noninvasive blood pressure monitoring of the wrist. *Biomed Instrum Technol*. 1997 Jan-



Feb;31(1):63-8. [PubMed](#)

Lauszus FF, Rosgaard A, Lousen T, Rasmussen OW, Klebe TM, Klebe JG. Precision, consistency, and reproducibility of blood pressure in diabetic and non-diabetic pregnancy: the appraisal of repeated measurements. *Acta Obstet Gynecol Scand*. 2007;86(9):1063-70. [PubMed](#)

Liebl M, Holzgreve H, Schulz M, Crispin A, Bogner J. The effect of clothes on sphygmomanometric and oscillometric blood pressure measurement. *Blood Press*. 2004;13(5):279-82. [PubMed](#)

Ma G, Sabin N, Dawes M. A comparison of blood pressure measurement over a sleeved arm versus a bare arm. *CMAJ*. 2008 Feb 26;178(5):585-9. [PubMed](#)

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Menard SW, Park MK, Yuan CH. The San Antonio Biethnic Children's Blood Pressure Study: auscultatory findings. *J Pediatr Health Care*. 1999 Sep-Oct;13(5):237-44. [PubMed](#)

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Mourad A, Gillies A, Carney S. Inaccuracy of wrist-cuff oscillometric blood pressure devices: an arm position artefact?. *Blood Press Monit*. 2005 Apr;10(2):67-71. [PubMed](#)

Nelson D, Kennedy B, Regnerus C, Schweinle A. Accuracy of automated blood pressure monitors. *J Dent Hyg*. 2008 Summer;82(4):35. [PubMed](#)

Nowak RM, Sen A, Garcia AJ, Wilkie H, Yang JJ, Nowak MR, Moyer ML. Noninvasive continuous or intermittent blood pressure and heart rate patient monitoring in the ED. *Am J Emerg Med*. 2011 Sep;29(7):782-9. [PubMed](#)

O'Shea J, Dempsey EM. A comparison of blood pressure measurements in newborns. *Am J Perinatol*. 2009 Feb;26(2):113-6. [PubMed](#)

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Schell K, Briening E, Lebet R, Pruden K, Rawheiser S, Jackson B. Comparison of arm and calf automatic noninvasive blood pressures in pediatric intensive care patients. *J Pediatr Nurs.* 2011 Feb;26(1):3-12. [PubMed](#)

Schell K, Lyons D, Bradley E, Bucher L, Seckel M, Wakai S, Carson E, Waterhouse J, Chichester M, Bartell D, Foraker T, Simpson EK. Clinical comparison of automatic, noninvasive measurements of blood pressure in the forearm and upper arm with the patient supine or with the head of the bed raised 45 degrees: a follow-up study. *Am J Crit Care.* 2006 Mar;15(2):196-205. [PubMed](#)

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Skirton H, Chamberlain W, Lawson C, Ryan H, Young E. A systematic review of variability and reliability of manual and automated blood pressure readings. *J Clin Nurs.* 2011 Mar;20(5-6):602-14. [PubMed](#)

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Wattigney WA, Webber LS, Lawrence MD, Berenson GS. Utility of an automatic instrument for blood pressure measurement in children The Bogalusa Heart Study. *Am J Hypertens.* 1996 Mar;9(3):256-62. [PubMed](#)

Weaver MG, Park MK, Lee DH. Differences in blood pressure levels obtained by auscultatory and oscillometric methods. *Am J Dis Child.* 1990 Aug;144(8):911-4. [PubMed](#)

Wong SN, Tz Sung RY, Leung LC. Validation of three oscillometric blood pressure devices against auscultatory mercury sphygmomanometer in children. *Blood Press Monit.* 2006 Oct;11(5):281-91. [PubMed](#)

## Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

## Benefits/Harms of Implementing the Guideline Recommendations

### Potential Benefits

Appropriate non-invasive blood pressure measurement with automated devices

## Potential Harms

Inaccuracies in blood pressure measurement may delay treatment of a serious condition and/or result in clinical decisions that under- or over-treat the patient's medical condition.

## Qualifying Statements

### Qualifying Statements

- The Emergency Nurses Association (ENA)'s Clinical Practice Guidelines (CPGs) are developed by ENA members to provide emergency nurses with evidence-based information to utilize and implement in their care of emergency patients and families. Each CPG focuses on a clinical or practice-based issue, and is the result of a review and analysis of current information believed to be reliable. As such, information and recommendations within a particular CPG reflect the current scientific and clinical knowledge at the time of publication, are only current as of their publication date, and are subject to change without notice as advances emerge.
- In addition, variations in practice, which take into account the needs of the individual patient and the resources and limitations unique to the institution, may warrant approaches, treatments and/or procedures that differ from the recommendations outlined in the CPGs. Therefore, these recommendations should not be construed as dictating an exclusive course of management, treatment or care, nor does the use of such recommendations guarantee a particular outcome. CPGs are never intended to replace a practitioner's best nursing judgment based on the clinical circumstances of a particular patient or patient population. CPGs are published by ENA for educational and informational purposes only, and ENA does not approve or endorse any specific methods, practices, or sources of information. ENA assumes no liability for any injury and/or damage to persons or property arising out of or related to the use of or reliance on any CPG.

## Implementation of the Guideline

### Description of Implementation Strategy

An implementation strategy was not provided.

### Implementation Tools

Quick Reference Guides/Physician Guides

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

## Institute of Medicine (IOM) National Healthcare Quality Report Categories

### IOM Care Need

Getting Better

Staying Healthy

### IOM Domain

Effectiveness

# Identifying Information and Availability

## Bibliographic Source(s)

ENA Emergency Nursing Resources Development Committee. Clinical practice guideline: non-invasive blood pressure measurement with automated devices. Des Plaines (IL): Emergency Nurses Association; 2012 Dec. 13 p. [53 references]

## Adaptation

Not applicable: The guideline was not adapted from another source.

## Date Released

2012 Dec

## Guideline Developer(s)

Emergency Nurses Association - Professional Association

## Source(s) of Funding

Emergency Nurses Association

## Guideline Committee

2012 ENA Emergency Nursing Resources Development Committee

## Composition of Group That Authored the Guideline

*Committee Members:* Susan Barnason, PhD, RN, APRN-CNS, CEN, CCRN, FAAN; Jennifer Williams, MSN, RN, CEN, CCRN, CNS; Vicki C. Patrick, MS, RN, SRPN, ACNP, CEN, FAEN; Andrew Storer, DNP, RN, ACNP, CRNP, FNP; Carla Brim, MN, RN, CEN, CNS; Judith Halpern, MS, RN, APRN; Sherry Leviner, MSN, RN, CEN; Cathleen Lindauer, MSN, RN, CEN; Jean A. Proehl, MN, RN, CEN, CPEN, FAEN; Judith Young Bradford, DNS, RN, FAEN

## Financial Disclosures/Conflicts of Interest

Not stated

## Guideline Status

This is the current release of the guideline.

## Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the [Emergency Nurses Association Web site](#) .

## Availability of Companion Documents

The following are available:

- Requirements for the development of: clinical practice guidelines, clinical practice guidelines synopsis, and translation into practice (TIP) recommendations. Des Plaines (IL): Emergency Nurses Association; 2013 Dec. 40 p. Electronic copies: Available in Portable Document Format (PDF) from the [Emergency Nurses Association Web site](#) .
- Clinical practice guideline: non-invasive blood pressure measurement with automated devices. Synopsis. Des Plaines (IL): Emergency Nurses Association; 2012 Dec. 1 p. Electronic copies: Available in PDF from the [Emergency Nurses Association Web site](#) .
- CPG evidence table: non-invasive blood pressure measurement with automated devices. Des Plaines (IL): Emergency Nurses Association; 2012 Dec. 22 p. Electronic copies: Available in PDF from the [Emergency Nurses Association Web site](#) .
- CPG other resources table: non-invasive blood pressure measurement with automated devices. Other resources table. Des Plaines (IL): Emergency Nurses Association; 2012 Dec. 1 p. Electronic copies: Available in PDF from the [Emergency Nurses Association Web site](#) .

## Patient Resources

None available

## NGC Status

This NGC summary was completed by ECRI Institute on February 13, 2014. The information was verified by the guideline developer on March 27, 2014.

## Copyright Statement

This summary is based on the original guideline, which is subject to the guideline developer's restrictions.

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